3Com® Corporation

PathBuilder™ S200 Series Switch
Trans Polled Async

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Overview

The Transparent Polled Async (TPA) software option supports various asynchronous protocols that operate in polled environments. TPA allows complete asynchronous messages to be transmitted without the intercharacter delay normally encountered when using the standard asynchronous PAD.

Hardware Requirements

The Transparent Polled Async option is available on PathBuilder S200 series switch platforms.

Custom Software Key (CSKs)

You may have to access TPA by using either a Custom Software Key (CSK). This is provided with your option and is recognized only by the specific product for which it is made. To enter a CSK:

Step	*Action*
1	Select Configure from the Main menu.
2	Select Software Key Table from the Configure menu. The Entry Number field is provided for reference purposes in the event you later need to change or update a specific option.
3	Assign an Entry Number and press Return.
4	Enter the key number in the Key Value field and press Return.
5	Press Escape to exit from the Software Key Table.
6	Save the information when prompted.

Additional Information

For more information about these keys, refer to the *Configuration Basics Guide.*

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Functionality

Introduction

This section describes Transparent Polled Async basic functionality.

Overview of TPA

A polled environment is present when a host computer communicates with remote devices through multipoint modems or a digital sharing device. Figure 1 shows three remote devices attached to the host's modem in a multipoint configuration. Through proper addressing, the host can send a poll message to Remote Device. A and receive a message in response to the poll. Using other addresses, the host can also send a poll message to Remote Device B or C.

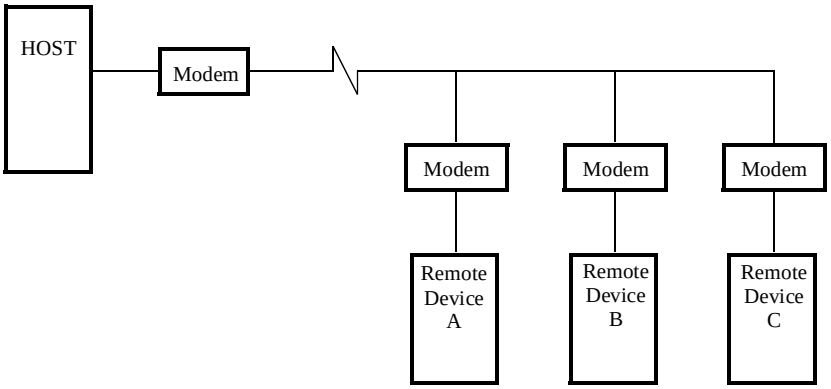

Figure 1. Transparent Polled Async Devices

In a typical PathBuilder S200 series switch asynchronous environment, data enters the PAD and is transmitted across the network when certain data forwarding requirements are met, for example:

- Data Forwarding Character is encountered
- Idle Timer expires
- Dynamic Data Forwarding is enabled
- Packet is full

Intercharacter delay, the delay between characters transmitted at the remote end, is inconsequential. However, in a Transparent Polled Async environment, excessive intercharacter delay may cause the remote user device to conclude incorrectly that the end of the message has been reached. To ensure that data is transmitted properly in this application, a PathBuilder S200 series switch PAD must not begin to transmit a message to a user device until it has received the entire message from the network. This is accomplished through proper use of the Data Forwarding Criteria and Message Assembly parameters. Refer to the section “Configuration” for information on these parameters.

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TPA 2K Frame Size Increase

Overview

During normal operation of the Transparent Polled Async (TPA) option, data packets pass through a network uninterrupted. However, when passing larger TPA packets over a network, the transfer of data becomes bursty and segmenting of data packets occurs. To avoid segmenting data packets, set up the PAD node for uninterrupted delivery of data packets up to 2K in size by enabling the TPA 2K Frame Size feature.

With the exception of the PathBuilder S24x, 26x, and 27x switch, all PathBuilder S200 series switches support the TPA 2K Frame Size Increase.

Enabling TPA 2K Frame Size

Follow these steps to configure TPA 2K Frame Size Feature:

Step	*Action*	
1	If the node is a PathBuilder S24x, 26x, and 27x switch, enable the CSK for the TPA option on this node.	
2	Enable the CSK for the TPA 2K Frame Size feature on the node. **Note** See the *Configuration Basics Guide* for details on enabling a CSK.	
3	Select **Configure -> PAD Profile Table -> #114 PAD Mode** from the CTP Main menu, and press Return.	
4	Set the PAD Mode parameter to 1 for a host node or 2 for a remote node.	
5	Boot the node. Performing a Node boot implements changes to the PAD node, but it is not always necessary. Perform one of the following boot procedures:	
	If you...	***Perform...***
	Changed a PAD Profile that is already attached to the PAD Port	A Table and Record boot.
	Are attaching a PAD Profile to a PAD port.	A Port boot.
	Created a Profile that you want to attach to a port.	A Table and Record boot and then a Port boot.

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Supported Protocols

Overview

The TPA option can be used with other protocols on the same MX25 or X25 lines. In Figure 2, an MX25 link and an X.25 link are used in a small network to switch Transparent Polled Async, Bisync, and SDLC data.

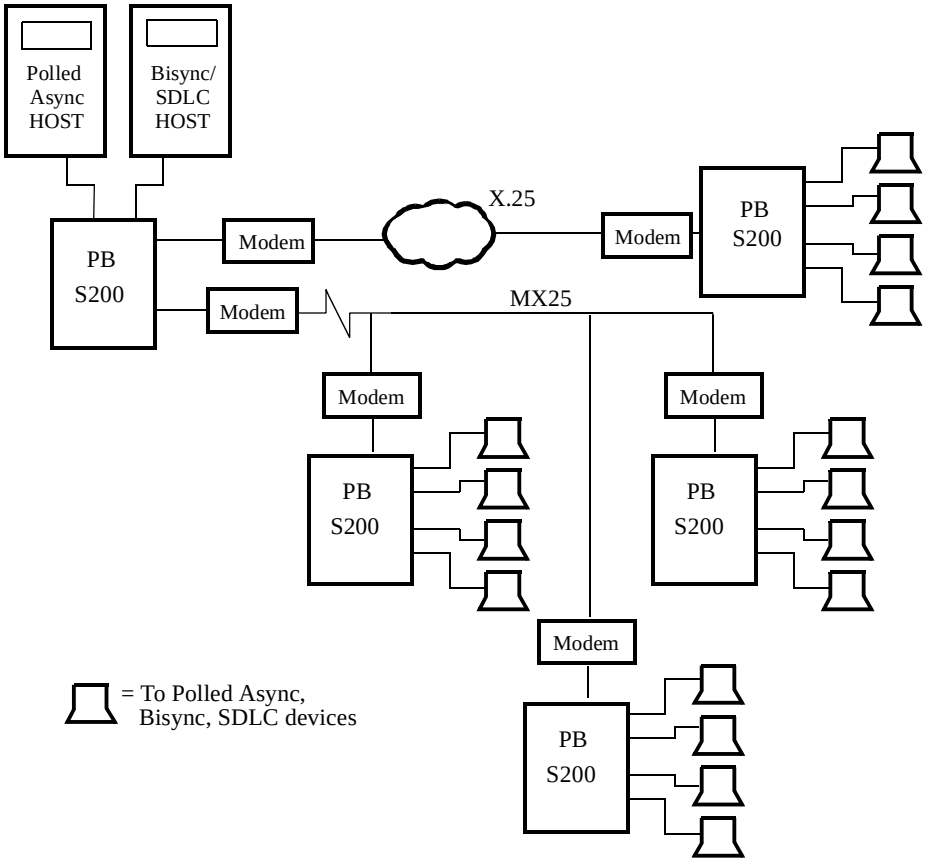

Figure 2. Transparent Polled Async Used with Other Protocols in a Network

Switched Carrier

In a Switched Carrier environment, the transmitting device raises the RTS signal, sends an asynchronous message, and then drops the RTS signal. When the PathBuilder S200 series switch sends the asynchronous message to the remote device, the device raises the DCD signal, sends the asynchronous message, and then drops the DCD signal. This action of performing Switched Carrier operations is configurable using the EIA Signalling Action parameter.

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Configuration

Overview

This section explains how to configure Transparent Polled Async (TPA) on PathBuilder S200 series switch platforms. Refer to the *Configuration Basics Guide* for information on logging on and accessing the Main menu from the CTP.

Figure 3 illustrates the PAD Profile parameters required to accommodate the different TPA environments. TPA parameters are enabled only when the parameter PAD Mode is set to 1 or 2 and cannot be used unless the TPA option has been purchased and enabled on the node.

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Creating a PAD Profile

Overview

To create a TPA PAD Profile, select Copy/Insert Record from the Main menu. Using the Copy Special PAD Profile from PROM function, you can copy default TPA PAD profiles. There are two default TPA PAD profiles:

- TPA_HOST – (for the Host PAD)
- TPA_RMOT – (for Remote PADs)

Once a default profile is copied, it can then be modified to meet your requirements. Copying default profiles is the recommended method of creating PAD Profiles because parameters not needed in polled environments are disabled. TPA PAD profiles can also be newly created rather than modified by using the Configure PAD Profile Table function.

Follow These Steps...

To create a new PAD profile:

Step	*Action*
1	Select **Configure** from the Main menu.
2	Select **PAD Profile Table** from the Configure menu.

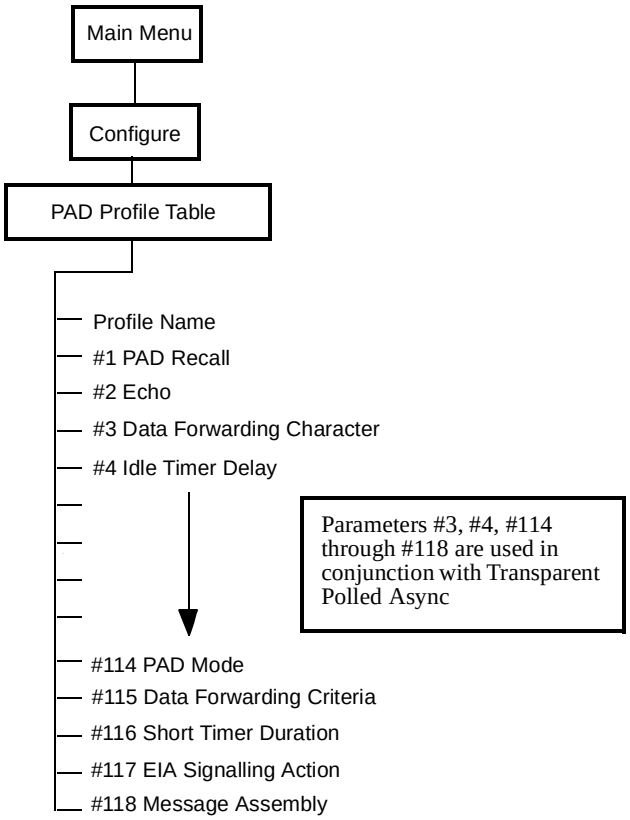

Figure 3. Transparent Polled Async PAD Profile Parameters

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PAD Profile Table Parameters

List of Parameters

Listed below are descriptions of the PAD Profile parameters that must be configured when using Transparent Polled Async. Refer to the *Configuring for APAD/ATPAD Manual* for a complete listing of PAD Profile parameter descriptions.

Data Forwarding Character (#3)

Range:	0 to 127
Default:	2
Description:	Selects the ASCII characters used for data forwarding. **NOTE:** A setting of zero disables this parameter. Refer to the *Configuration Basics Guide* for the ASCII Table.

Idle Timer Delay (#4)

Range:	0 to 255
Default:	0
Description:	Selects forwarding idle timer delay in increments of 50 milliseconds. A setting of 0 disables the Idle Timer.

PAD Mode (#114)

Range:	0 to 2
Default:	0
Description:	This parameter selects PAD Operational Mode • 0: Normal PAD Operation • 1: Transparent Polled Async Host PAD • 2: Transparent Polled Async Remote PAD **Note** Normal PAD operation deactivates Parameters #115 through #118. To operate TPA, or use the TPA 2K Frame Size Increase feature, set Parameter #114 to 1 for Host PAD and 2 for Remote PAD.

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Data Forwarding Criteria (#115)

Range:	0 to 2
Default:	0
Description:	Specifies the criteria for determining the end of an asynchronous message sent from an asynchronous device. When Data Forwarding Criteria settings are satisfied, the asynchronous message is sent into the X.25 network. • 0: Normal. Select Data Forwarding Character (#3) or Idle Timer Delay (#4). **NOTE:** These two parameters should not be used simultaneously. • 1: Short Timer. Short Timer Duration (#116) is used to provide a short idle timer delay in place of the standard idle timer period. • 2: RTS Signal Drop. The asynchronous message is terminated when the RTS signal is dropped by the attached device and data is automatically forwarded. No other settings are required. **Note** If parameter #115 is set to 2, you cannot have the port record connection type = DIMO, DIMOa, or DIMOb, because when RTS drops the connection is broken. Refer to the *Configuration Basics Guide* for descriptions of connection types.

This table provides a quick reference for identifying which parameter is used when the Data Forwarding Criteria (#115) parameter is set to 0, 1, or 2.

When Data Forwarding Criteria (#115) is set to...	*The Following Parameter Is Used...*
0	Data Forwarding Character (#3) or Idle Timer Delay (#4)
1	Short Timer Duration (#116)
2	No specific parameter used. Data is automatically forwarded when the RTS signal drops.
Note When Data Forwarding Criteria (#115-0) is used, select either #3 or #4. These parameters should not be used simultaneously.	

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Short Timer Duration (#116)

Range:	0 to 255
Default:	0
Description:	Selects Short Timer duration in milliseconds (used with #115). During receipt of an asynchronous message, if a character has not been received in the time period defined by Short Timer Duration, the message is determined to be complete and is sent into the X.25 network. Using a Short Timer instead of an Idle Timer when running high-speed asynchronous data usually results in better response times due to the smaller granularity. However, using Short Timer will increase CPU utilization as compared with the same application using the Idle Timer. • 0: Disabled • 1–255: Duration in milliseconds

EIA Signalling Action (#117)

Range:	0 or 1
Default:	0
Description:	This parameter selects EIA Signalling action. • 0: None • 1: Raise DCD before transmission and drop DCD after transmission.

Message Assembly (#118)

Range:	0 or 1
Default:	1
Description:	Message Assembly (#118) controls the transmission of a message received from the X.25 network to an attached device. • 0: Disabled. If Message Assembly (#118) is disabled, message transmission begins as soon as the first packet arrives from the X.25 network. • 1: Enabled. If Message Assembly (#118) is enabled, the entire message is buffered at the remote PAD before it is transmitted to the attached device. Buffering the message eliminates the possibility of intercharacter delays being introduced which could cause the attached device to misinterpret the end of the message.

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Enabling a PAD Profile

How To...

Once a TPA PAD Profile has been created for a PAD port, the profile can be designated as the current running profile for the PAD port. This is done by executing a Table and Node Record boot, followed by a boot of the specific port.

Refer to the “Administration” section for information about using the Boot command.

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Administration

Overview

This section describes the Boot command, which is used to enable the PAD Profile. Also described here are the statistics available for Transparent Polled Async (TPA). Complete information on all other statistics are described in the *Configuration Basics Guide*.

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Boot Command

Overview

Booting updates a node's operational parameters by using the parameters stored in configuration memory (CMEM).

Follow These Steps...

To designate a TPA PAD Profile as the current running profile for the PAD port:

Step	*Action*
1	Select Boot from the Main menu.
2	Select Table and Node Record from the Main menu; the Boot menu is redisplayed.
3	Select Port from the Boot menu and complete the process by booting the specific port.

For More Details...

For more information regarding the Boot command, refer to the *Configuration Basics Guide*.

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Detailed PAD Port Statistics

Statistics Command

The Statistics command lets you to monitor the status of different parts of the network. Use the information appearing on the Detailed Port Statistics screens shown in this section to monitor the operation of a node.

To View...

To view the Detailed Port Statistics:

Step	*Action*
1	Select Status/Statistics from the Main menu.
2	Select Detailed Port Statistics from the Status/Statistics menu.

The three screens shown in Figures 4, 5, and 6, display useful information about the selected port.

```
Node:                Address:           Date:           Time:
Detailed PAD Statistics: Port 3                         Page:  1 of 3

Port Number: 3       Port Type:  ASYNC PAD    Port Status: Up
Port Speed:  9600    Port State: X28          Port Utilization Out: 20%

Physical:
Parity Errors :  0   Overrun Errors : 0       Framing Errors : 0

 Data Summary:
                IN       OUT                            IN      OUT
Characters:    403425   484115     Characters/sec:       5       6
Packets:       80685    80696      Packets/sec:          1       1
Number of Packets Queued: 0

EIA Summary:                            INPUT            OUTPUT
                                    DTR RTS  MB P14    DSR DCD RI CTS
  State: Connected (SIMPLE           L   L   L   L      H   H   L   H



Press any key to continue ( ESC to exit ) ...
```

Figure 4. Detailed PAD Port Statistics - Page 1

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```
Node:                Address:           Date:          Time:
Detailed PAD Statistics: Port 3                        Page:  2 of 3

 Call Summary:
  Current Status: Disconnected
  Time until next auto-call attempt: 0 secs
  Number of auto-call attempts: 0
  Last clear cause code: 0 (Cleared by other end)
  Last clear diagnostic code: 0 (No more information)

 Last Inbound Call:
  Called Address:
  Calling Address:
  Facilities:
  CUD:

 Last Outbound Call:
  Called Address:  1020002
  Calling Address: 1010003
  Facilities:
  CUD: 01000000

Press any key to continue ( ESC to exit ) ...
```

Figure 5. Detailed PAD Port Statistics - Page 2

```
Node:                Address:           Date:          Time:
Detailed PAD Statistics: Port 3                        Page: 3 of 3


Current Running Profile:
 1:1     2:1     3:2     4:0     5:0     6:5     7:2     8:0
 9:0     10:0    11:14   12:1    13:4    14:0    15:1    16:8
 17:24   18:18   19:2    20:255  21:7    22:0
 100:0   101:0   102:0   103:17  104:19  105:0   106:0   107:0
 108:0   109:0   110:0   111:0   112:0   113:0   114:2   115:2
 116:0   117:0   118:0   119:0



Press any key to continue ( ESC to exit ) ...
```

Figure 6. Detailed PAD Port Statistics - Page 3

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PAD Port Statistics

This table explains the terms used in PAD Port Statistics screens to help you interpret the Statistics displays.

Term	Description
Port Number	Specifies a specific port in the network diagram
Port Type	Indicates the type of port. **Note** **Async PAD** is the only port type that supports the Transparent Polled Async option
Port Status	Specifies the current port status • **Up:** Port is operational • **Disabled:** Port has been disabled
Speed	Message transmission speed in bits per second
Port State	Specifies the current state of the port: • **PAD:** Port has call established • **X28:** Port in X.28 command mode • **Password:** Port is waiting for password entry
Port Utilization	Factor determined by comparison of volume (characters per second) of data and clock rate for a specified port
Physical	• **Parity Errors:** Number of parity errors detected since last boot or statistics reset • **Overrun Errors:** Number of overrun errors detected since last boot or statistics reset • **Framing Errors:** Number of framing errors detected since last boot or statistics reset
Data Summary	• **Characters In:** Number of characters received since last boot or statistics reset • **Characters Out:** Number of characters transmitted since last boot or statistics reset • **Packets In:** Number of packets received since last boot or statistics reset • **Packets Out:** Number of packets transmitted since last boot or statistics reset • **Characters/Sec:** Average number of characters sent per second • **Packets/Sec:** Average number of packets sent per second • **Number of Packets Queued:** Current number of packets buffered since last boot or statistics reset

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Term	Description *(continued)*
EIA Summary	**State:** The current state of the EIA signals. For a complete listing of EIA states, refer to the *Configuration Basics Guide.* • Input: DTR (Data Terminal Ready) RTS (Request to Send) MB (Make Busy) P14 Ignored **Note** These signals are monitored by the Control Terminal Port. • Output: DSR (Data Set Ready) DCD (Carrier Detect) RI (Ring Indicator) CTS (Clear to Send) **Note** These signals are generated by the PathBuilder S200 series switch port.
Call Summary	Current Status: • **Connected:** Call is connected • **Disconnected:** Call is disconnected • **Called:** PAD Port is being called • **Calling:** PAD Port attempting to establish a call • **Clearing:** Call is in process of being cleared • **Local Copy:** PAD Port is in local copy mode • **Time until Next Autocall Attempt:** Specifies the time interval between Autocall attempts in seconds • **Number of Autocall Attempts:** Specifies the number of times the Host PAD or the Remote PAD attempts to call when Autocalling is enabled • **Last Clear Cause or Last Clear Diagnostic Code:** These messages explain why the last call was cleared. For more information, refer to the *Configuration Basics Guide.*
Last Inbound Call	• **Called Address:** Works in conjunction with the link's Inbound Called Address for inbound calls • **Calling Address:** Works in conjunction with the link's Inbound Calling Address for inbound calls • **Facilities:** Parameter and option settings that are checked during inbound call processing • **CUD:** Specifies that the subaddress for the call is carried in the Call User Data (CUD) field of a call request

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Term	Description *(continued)*
Last Outbound Call	• **Called Address:** Works in conjunction with the link's Outbound Called Address for outbound calls • **Calling Address:** Works in conjunction with the link's Outbound Calling Address for outbound calls • **Facilities:** Parameter and option settings that are checked during outbound call processing • **CUD:** Specifies that the subaddress for the call is carried in the Call User Data (CUD) field of a call request
Current Running Profile	List of current profile values

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PAD Profile Table Configuration Worksheet

Entry Number						
Profile Name						
#1 PAD Recall						
#2 Echo						
#3 Data Forwarding Character						
#4 Idle Timer Delay						
#5 Device Flow Control						
#6 Service Signals Control						
#7 Break Signal Operation						
#9 Padding after Carriage Return						
#10 Line Folding						
#12 PAD Data Restraint						
#13 Line Feed Insertion after CR						
#14 Padding after LF						
#15 Editing						
#16 Character Delete						
#17 Line Delete						
#18 Line Display						
#19 Editing Type						
#20 Echo Mask						
#21 Parity Treatment						
#22 Page Wait						
#100 Break Character						
#101 Echo Substitution Toggle Character						
#102 Echo Substitution Character						
#103 XON Character						
#104 XOFF Character						
#105 Control Signal (EIA-232-D) Data Restraint						
#106 Network Parity						
#107 Idle Disconnect Timer						
#108 Disconnect Character						
#109 Form Feed Padding						
#110 ESC Forwarding Delay						
#111 Echo Control						
#112 Dynamic Data Forwarding						
#113 Hewlett-Packard flow control						
#114 PAD Mode						
#115 Data Forwarding Criteria						

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#116 Short Timer Duration						
#117 EIA Signalling Action						
#118 Message Assembly						

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Appendix A
Technical Support

3Com provides easy access to technical support information through a variety of services. This appendix describes these services.

Information contained in this appendix is correct at time of publication. For the very latest, 3Com recommends that you access the 3Com Corporation World Wide Web site.

Online Technical Services

3Com offers worldwide product support 24 hours a day, 7 days a week, through the following online systems:

- World Wide Web site
- 3Com FTP site
- 3Com Bulletin Board Service (3Com BBS)
- 3ComFacts℠ automated fax service

World Wide Web Site

Access the latest networking information on the 3Com Corporation World Wide Web site by entering the URL into your Internet browser:

http://www.3com.com/

This service provides access to online support information such as technical documentation and software library, as well as support options ranging from technical education to maintenance and professional services.

3Com FTP Site

Download drivers, patches, and software, across the Internet from the 3Com public FTP site. This service is available 24 hours a day, 7 days a week.

To connect to the 3Com FTP site, enter the following information into your FTP client:

- Hostname: **ftp.3com.com (or 192.156.136.12)**
- Username: **anonymous**
- Password: **<your Internet e-mail address>**

Note

A user name and password are not needed with Web browser software such as Netscape Navigator and Internet Explorer.

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3Com Bulletin Board Service

The 3Com BBS contains patches, software, and drivers for 3Com products. This service is available through analog modem or digital modem (ISDN) 24 hours a day, 7 days a week.

Access by Analog Modem

To reach the service by modem, set your modem to 8 data bits, no parity, and 1 stop bit. Call the telephone number nearest you:

Country	*Data Rate*	*Telephone Number*
Australia	Up to 14,400 bps	61 2 9955 2073
Brazil	Up to 14,400 bps	55 11 5181 9666
France	Up to 14,400 bps	33 1 6986 6954
Germany	Up to 28,800 bps	4989 62732 188
Hong Kong	Up to 14,400 bps	852 2537 5601
Italy	Up to 14,400 bps	39 2 27300680
Japan	Up to 14,400 bps	81 3 3345 7266
Mexico	Up to 28,800 bps	52 5 520 7835
P.R. of China	Up to 14,400 bps	86 10 684 92351
Taiwan, R.O.C.	Up to 14,400 bps	886 2 377 5840
U.K.	Up to 28,800 bps	44 1442 438278
U.S.A.	Up to 28,800 bps	1 408 980 8204

Access by Digital Modem

ISDN users can dial in to the 3Com BBS using a digital modem for fast access up to 56 Kbps. To access the 3Com BBS using ISDN, use the following number:

1 408 654 2703

3ComFacts Automated Fax Service

The 3ComFacts automated fax service provides technical articles, diagrams, and troubleshooting instructions on 3Com products 24 hours a day, 7 days a week.

Call 3ComFacts using your Touch-Tone telephone:

1 408 727 7021

Support from Your Network Supplier

If additional assistance is required, contact your network supplier. Many suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

When you contact your network supplier for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

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If you are unable to contact your network supplier, see the following section on how to contact 3Com.

Support from 3Com

If you are unable to obtain assistance from the 3Com online technical resources or from your network supplier, 3Com offers technical telephone support services. To find out more about your support options, please call the 3Com technical telephone support phone number at the location nearest you.

When you contact 3Com for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

Below is a list of worldwide technical telephone support numbers:

Country	*Telephone Number*	*Country*	*Telephone Number*
Asia Pacific Rim			
Australia	1 800 678 515	P.R. of China	10800 61 00137 or
Hong Kong	800 933 486		021 6350 1590
India	61 2 9937 5085	Singapore	800 6161 463
Indonesia	001 800 61 009	S. Korea	
Japan	0031 61 6439	From anywhere in S. Korea:	82 2 3455 6455
Malaysia	1800 801 777	From Seoul:	00798 611 2230
New Zealand	0800 446 398	Taiwan, R.O.C.	0080 611 261
Pakistan	61 2 9937 5085	Thailand	001 800 611 2000
Philippines	1235 61 266 2602		
Europe			
From anywhere in Europe, call:	+31 (0)30 6029900 phone +31 (0)30 6029999 fax		
From the following European countries, you may use the toll-free numbers:			
Austria	06 607468	Netherlands	0800 0227788
Belgium	0800 71429	Norway	800 11376
Denmark	800 17309	Poland	0800 3111206
Finland	0800 113153	Portugal	05 05313416
France	0800 917959	South Africa	0800 995014
Germany	0130 821502	Spain	900 983125
Hungary	00800 12813	Sweden	020 795482
Ireland	1 800 553117	Switzerland	0800 55 3072
Israel	177 3103794	U.K.	0800 966197
Italy	1678 79489		
Latin America			
Argentina	541 312 3266	Colombia	571 629 4847
Brazil	55 11 523 2725, ext. 422	Mexico	01 800 849 2273
North America	1 800 NET 3Com (1 800 638 3266)		

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Returning Products for Repair

Before you send a product directly to 3Com for repair, you must first obtain a Return Materials Authorization (RMA) number. Products sent to 3Com without RMA numbers will be returned to the sender unopened, at the sender's expense.

To obtain an RMA number, call or fax:

Country	*Telephone Number*	*Fax Number*
Asia, Pacific Rim	65 543 6342	65 543 6348
Europe, South Africa, and Middle East	011 44 1442 435860	011 44 1442 435718
From the following European countries, you may call the toll-free numbers; select option 2 and then option 2:		
Austria	06 607468	
Belgium	0800 71429	
Denmark	800 17309	
Finland	0800 113153	
France	0800 917959	
Germany	0130 821502	
Hungary	00800 12813	
Ireland	1800553117	
Israel	177 3103794	
Italy	1678 79489	
Netherlands	0800 0227788	
Norway	800 11376	
Poland	00800 3111206	
Portugal	05 05313416	
South Africa	0800 995014	
Spain	900 983125	
Sweden	020 795482	
Switzerland	0800 55 3072	
U.K.	0800 966197	
Latin America	1 408 326 2927	1 408 764 6883
U.S.A. and Canada	1 800 876 3266, option 2	1 408 764 7120

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